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CROPS FROM WHICH DRUGS ARE EXTRACTED AND APPROPRIATE STRATEGIES FOR THEIR REDUCTION

Report of the Secretariat

Summary

The Commission on Narcotic Drugs, at its thirty-eighth session, requested that a report should be prepared on crops from which drugs are extracted and on appropriate strategies for their reduction. The present report responds to that request. Eradication efforts and their impact on illicit cultivation are examined at the national and global levels, and the distinction between alternative development, on the one hand, and both crop substitution and more general economic development efforts, on the other, is reviewed. Over the last two decades, alternative development work in 11 countries by the United Nations International Drug Control Programme and its predecessors has led to the accumulation of considerable experience in the implementation of policies and programmes. Those efforts and the conditionalities related to reductions in illicit cultivation are also reviewed.

*E/CN.7/1996/1.

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INTRODUCTION

1. At its thirty-eighth session, the Commission on Narcotic Drugs decided to add to the provisional agenda for its thirty-ninth session an item on crops from which drugs are extracted and appropriate strategies for their reduction, and requested the Secretariat to prepare an appropriate document on the issue. The present report reviews trends in, and recent efforts to reduce, illicit cultivation, as well as the status of strategies and issues relating to their implementation.

2. The quality and degree of coverage of empirical evidence regarding illicit cultivation and production vary enormously. Where possible, official government statements, the United Nations International Drug Control Programme (UNDCP) or verifiable sources of information have been used. Annual data relate mainly to 1994, with information for 1995 included where available.

A. Licit cultivation

3. Licit cultivation of crops from which drugs are extracted, while not the subject of the present report, can sometimes complicate assessment and enforcement efforts, particularly when the diversion of narcotics crops from licit cultivation must be dealt with, or when it is necessary to distinguish between licit and illicit cultivation. The parameters for the control and eradication of opium poppy, coca bush and cannabis plant are defined by the Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol,[1] and by article 14 of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988.[2] As reported to the International Narcotics Control Board, cannabis plant is produced for purposes of scientific research in the United States of America. Strains of cannabis with low tetrahydrocannabinol content are cultivated for horticultural and industrial purposes in many countries, including several in the European Community. With respect to opium for medical purposes, India has been the principal producer and sole licit supplier over several decades, while China and the Democratic People's Republic of Korea produce for domestic medical needs, and Japan produces small amounts to preserve traditional know-how. The licit cultivation of poppy to produce poppy straw has taken place primarily in Australia, France, Spain and Turkey in the 1990s. Under existing national law, approximately 12,000 hectares of coca bush are cultivated for licit purposes in Bolivia, and an estimated 17,800 hectares in Peru.

B. Reduction of illicit cultivation

4. Reducing illicit crop cultivation is herein defined as a reduction in the area of land devoted to illicit cultivation, expressed in hectares. It forms a principal component of supply reduction strategies, and, other things being equal, reduces illicit drug supply, thereby probably increasing retail prices. This process is assumed to lead to a decline in the whole range of direct and indirect individual, social and economic costs related to illicit drug use and drug control.

5. Certain factors may act to lessen the impact of reduced illicit cultivation. Adjustments made in illicit cultivation, production and manufacturing in order to absorb some of the impact of strategies to reduce cultivation are analysed in detail in the present report. The attempts by traffickers to encourage farmers to continue cultivation, through increasing the prices paid for illicitly grown crops, are also covered. Issues that are indirectly related to illicit cultivation because of their possible impact upon crop prices are not discussed, except where of direct relevance. Those issues include measures to control precursors, to intercept drugs within source countries and internationally, and to reduce demand by a variety of strategies.

I. TRENDS IN HECTARAGE OF GLOBAL ILLICIT CULTIVATION

A. Measurement issues

6. Issues relating to the measurement of illicit cultivation are important because of their effects on resource allocation and on the implementation and evaluation of strategies. A variety of general constraints influences estimates of illicit cultivation. They include the time of the year and stage of the crop cycle when measurement takes place, crop characteristics and local circumstances. The geographical dispersion and wide variation in size of areas under illicit cultivation (small fields are more difficult to detect), the remoteness of the terrain and the deliberate camouflaging of illicit crops through intercropping make estimation difficult. The sheer size of some regions of illicit cultivation may impose logistical constraints, while the constantly shifting and sometimes migratory nature of illicit cultivation make it a moving and changing target.

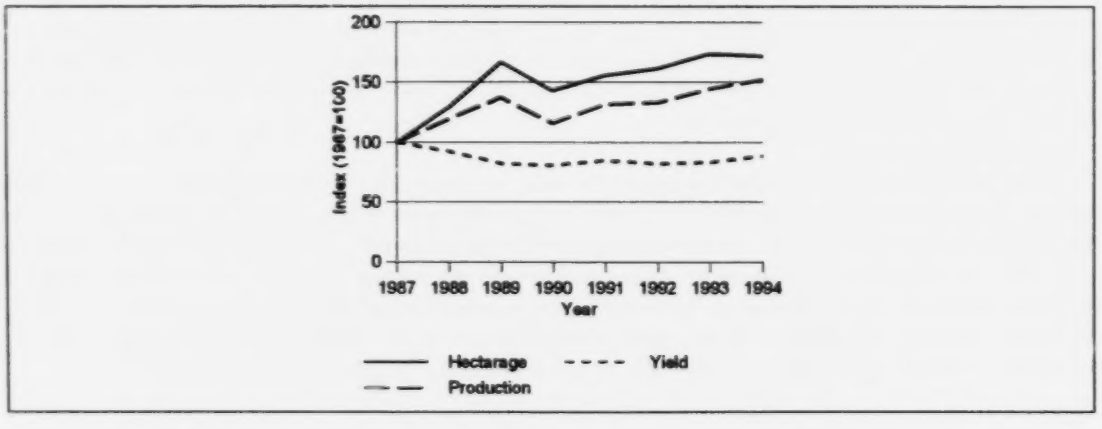
7. In addition to general constraints, varying sampling and survey methods can produce different estimates of hectarage. Remote sensing by satellite, observation or photographic sensing from aircraft, and ground surveys of fields or farmers, using different methods, each have strengths and weaknesses. While triangulation from different methods can reduce error, it is more costly. Remote sensing estimates vary with the technology used, with the method of sampling which areas to observe, and with the digital or visual classification of land use. Ground survey measurements may be hindered by difficulties in distinguishing between the boundaries of districts in remote locations, while access to some areas may be difficult and risky.

B. Magnitude of and trends in illicit hectarage

1. Opium poppy

8. Figure I shows estimated trends in hectarage of illicit opium poppy cultivation, opium production, and yield per hectare, from 1987 to 1994. Hectarage increased rapidly in the mid- to late-1980s to about 260,000 hectares, then, after a drop, increased gradually to about 280,000 hectares in 1994. The apparent reductions in yield reflected in figure I are probably due in part to changes in yield measurement techniques, or to an unusually high yield in 1987.

Figure I. Trends in illicit opium poppy cultivation, opium yield and opium production, 1987-1994

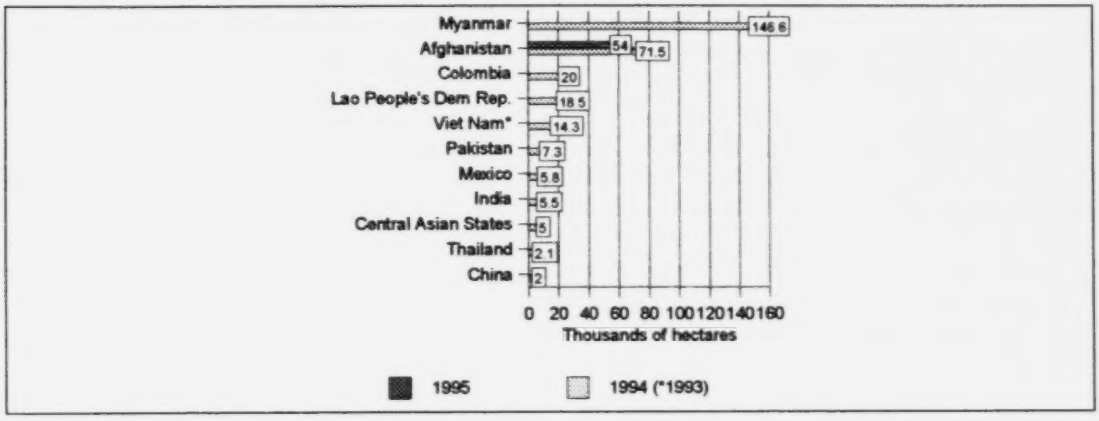


Sources: Government sources and UNDCP.

Note: Where a range of estimates was available, a midpoint was used.

9. Figure II shows estimated hectarage, by country, for 1994, when Afghanistan and Myanmar were the two main countries of illicit opium poppy cultivation. Since the mid-1980s, opium poppy cultivation has been detected in Colombia, where it increased rapidly in the 1990s to cover an estimated 20,000 hectares in 1994. A survey conducted by UNDCP in 1993 showed extensive poppy cultivation in Viet Nam, while a UNDCP survey of Afghanistan suggested that poppy cultivation in that country had declined significantly in 1995.

Figure II. Opium poppy cultivation, estimated by country, 1994 and 1995



Sources: Government sources and UNDCP.

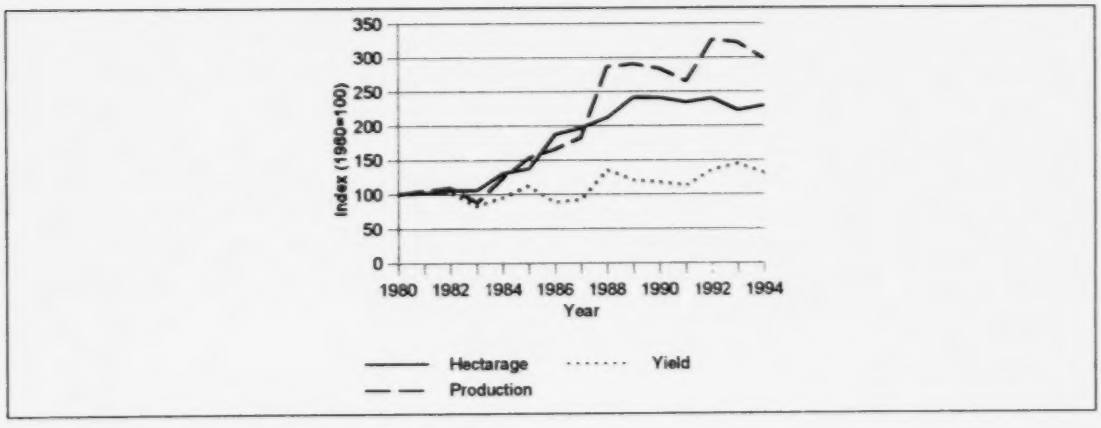
Note: Where a range of estimates was available, a midpoint was used.

[a]1993 data.

2. Coca bush

10. Figure III shows estimated trends in hectarage of coca bush cultivation, coca leaf yield per hectare, and estimated production from 1980 to 1994. After doubling in the second half of the 1980s to more than 200,000 hectares, the total area of cultivation, although showing a slight decline, remained relatively stable from 1990 to 1994.

Figure III. Trends in illicit coca bush cultivation, coca leaf yields and coca leaf production, 1980-1994



Sources: Government sources and UNDCP.

Note: Where a range of estimates was available, a midpoint was used.

11. In 1994, despite some illicit cultivation of the coca bush in other Latin American countries, approximately a half of global cultivation took place in Peru (more than 108,000 hectares), while Bolivia (about 48,000 hectares) and Colombia (about 45,000 hectares) each accounted for nearly one quarter of the total, although, as noted above, some of the cultivation in Bolivia and Peru is licit. The estimated hectarage in Colombia increased rapidly from about 3,000 hectares in the early 1980s to about 45,000 hectares by 1994, to some extent offsetting reductions that occurred in Peru in the early 1990s.

3. Cannabis plant

12. Estimates of the hectarage of global cannabis cultivation are less readily available than those for opium poppy or coca bush, for the reasons outlined in the report of the Secretariat on illicit drug trafficking (E/CN.7/1996/9).

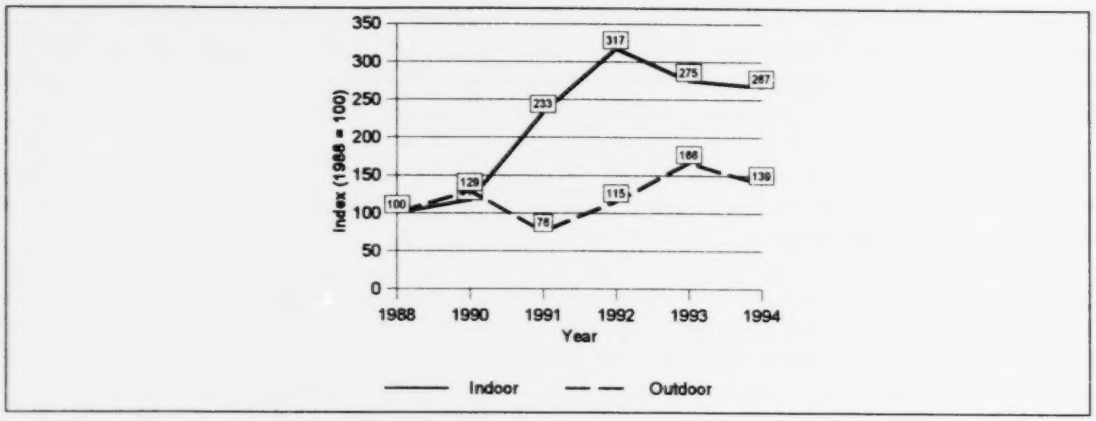
13. The large areas of wild growth of cannabis, estimated to cover approximately 170,000 hectares in the member States of the Commonwealth of Independent States (CIS) in Central Asia are reported to be "escaped" growth in areas that previously were the home of the licit hemp industry.

14. A recent survey by the South African police estimated cannabis cultivation in South Africa at 82,734 hectares, far greater than previous estimates, but the extent of cultivation in the rest of Africa and in much of Asia remains largely unknown. Over 50,000 hectares of illicit cannabis cultivation in Morocco, less than 20,000 in Mexico, and substantial areas of illicit cultivation in Colombia and Jamaica were reported in 1994.

15. The official United States government estimate of cannabis production in 1993 was between 6,000 and 7,000 tonnes of herb. While there are no official estimates of the hectarage of cannabis cultivation in the United States, nearly 53,600 outdoor cannabis plots were eradicated in 1994, which suggests that the United States may have one of the largest areas of illicit cannabis cultivation in the world.

16. Two recent developments in cannabis cultivation have been the increase in the growth of more potent strains of cannabis, such as sinsemilla, and the increased use of hydroponic techniques. Some indication of the growth of indoor cultivation might be gleaned from the trends in seizure data shown in figure IV for the United States, where the information was most readily available. Indoor operations increased nearly threefold between 1988 and 1994, though the absolute level of seizures (about 3,200 in 1994) remained far below that of outdoor plots eradicated. Indoor operations are faster and more advanced agronomically, resulting in multiple crops per year. The extent to which indoor operations produce crops for sale rather than personal use, and the number of countries in which such operations occur, are currently not known.

Figure IV. Trends in the eradication of indoor and outdoor cannabis cultivation in the United States, 1988-1994



Sources: Data for 1991-1994 drawn from the annual reports questionnaire of the United Nations International Drug Control Programme; data for 1989-1990 drawn from Drug Enforcement Administration sources cited in R. R. Clayton, *Marijuana in the "Third World": Appalachia, U.S.A.*, United Nations Research Institute for Social Development and United Nations University Studies on the Impact of the Illegal Drug Trade (London, Lynne Rienner, 1995), vol. 5.

Note: The estimated number of plots seized in 1992 is derived from a report that 271.4 million plants were eradicated in 1992, and from the 1993 average of 6,097 plants per outdoor plot.

II. STRATEGIES TO REDUCE HECTARAGE

A. Eradication

1. Techniques

17. The four known techniques of eradication are mechanical destruction (usually slashing or uprooting), burning, chemical, and biological (including genetic) eradication. Many of the relevant issues were presented to the Commission in the report of the Expert Group Meeting on Environmentally Safe Methods for the Eradication of Illicit Narcotic Plants, held at Vienna from 4 to 8 December 1989 (E/CN.7/1990/CRP.7). The two main techniques currently used are mechanical and chemical.

18. Chemical eradication was developed for agricultural weed control. The choice of herbicides is limited to those currently available commercially. This situation is likely to continue because of the relatively small size of the market for herbicides used solely for the eradication of illicit crops. Therefore, the development and evaluation of crop-specific and environmentally safe herbicides is commercially unviable. In the case of opium poppy, coca bush and cannabis plant, there is for each at least one herbicide which has a low environmental risk when applied according to its guidelines. Glyphosate has been applied to all three plants, and 2,4-dichlorophenoxyacetic acid (2,4-D) to opium poppy, both in the form of liquid sprays. For coca bush, tebuthiuron and hexazinone, which are granular and applied by aerial distribution, have been used, and for cannabis plant, the liquid spray 2',4',5',7' - tetrabromofluorescein, known as Eosine Yellowish, although the latter can cause some browning of leaves of adjacent vegetation.

19. Since environmentally safe eradication methods exist for each plant, when chemicals are used according to their guidelines, then the question arises as to why they have been implemented only in some areas, and why illicit cultivation sometimes continues in those areas.

2. Implementation

20. Some States are more willing to implement eradication than others, and to try different forms of eradication. In some States, illicit cultivation forms an important part of local, or even national, economies, and has considerable popular support. That can lead to political opposition to, and protests and demonstrations against, eradication. Some areas under illicit cultivation are not wholly under the control of the State, a situation which can make eradication both difficult and risky.

21. Difficulties in the detection of illicit crops can hinder the implementation of eradication. Topographical characteristics and the camouflage of illicit crops through the use of intercropping, dispersed plots and remote locations make detection difficult.

22. In some areas, the proximity of illicit cultivation to domestic dwellings can increase the risks of chemical eradication. Bolivia, Peru and Thailand, for example, implement only manual eradication of illicit crops. However, the mechanical eradication of the hardy coca bush in Bolivia and Peru is difficult, and has previously been made more so by the disruptive tactics of some organizations of coca farmers.

3. Adaptive responses to different applications of eradication

23. The methods and tactics of application are important in determining the impact of eradication efforts. Eradication has been applied either as one-time or "shock" eradication, or as periodic eradication which could be applied at similar or different time intervals.

24. One-time eradication does not necessarily reduce the amount of a drug extracted in direct proportion to the amount of crops eradicated. If 50 per cent of crops are eradicated, the volume of drugs extracted from the remainder can be more than 50 per cent of the previous level, if farmers adapt their production and initial processing techniques, or if traffickers adapt their manufacturing techniques. Both can adjust the proportion of labour that is used in the processes, in order to squeeze out further drugs from a reduced hectarage. Because of its covert nature, empirical evidence regarding such adjustments is largely anecdotal, but they will take place to the extent that they become economically viable.

25. The Thailand Opium Yield Project sponsored by the United States suggested that farmers normally gather at most 85 per cent of the opium from each plant pod, after three lancings. The smaller amounts gained from further lancings are normally not worth the extra effort or labour cost. Similarly, farmers do not bleed opium from many of the smaller pods, estimated at 20 per cent of the total. If reduction in hectarage due to eradication caused the price of opium to increase, it could become economically viable for farmers to extract more opium from each pod, and from smaller pods. A conservative estimate is that greater labour input could increase production by 15 to 20 per cent in times of scarcity, while heroin manufacturers will make efforts to maximize the extraction of morphine from opium. In Afghanistan, where labour is cheap and mobile, a UNDCP survey found that opium pods are lanced, on average, five times.

26. With respect to coca leaf, farmers employ more labour, in times of shortage, to pick a greater proportion of leaves from the bush, including smaller and less attractive leaves with lower alkaloid content. Processing is conducted more carefully and over a longer period to ensure the removal of greater amounts of alkaloids.[3] A further "adaptation" by farmers that has been noted when leaf prices are low has been the increased tendency to undertake first-stage processing to add value to the product prior to sale.

27. Periodic eradication produces a different adaptive response from producers. Latin America has seen protests of a violent and non-violent nature, the camouflaging of crops against aerial observation and the removal of cultivation to more remote and protected areas. The main response to periodic eradication, however, is anticipatory planting of larger areas of illicit crops. Such a response may lead to even larger areas of illicit cultivation.

28. The adaptive responses to different tactical applications of eradication seem to have three effects. The first is to reduce the impact upon overall hectarage; the second is to further reduce the impact upon the volume of drugs extracted; and the third, owing to anticipatory new planting, is to cause diminishing returns to investment in eradication as it is repeatedly applied.

4. Recent efforts to reduce hectarage

29. While some countries have major areas of illicit cultivation of more than one type of crop from which drugs are extracted, major eradication efforts are reviewed, by type of crop, at the country level, followed by an overview of impact at the global level. It is of note that some countries with large areas of illicit cultivation, but where eradication has not taken place, or where information regarding eradication was not available, are not covered in this section.

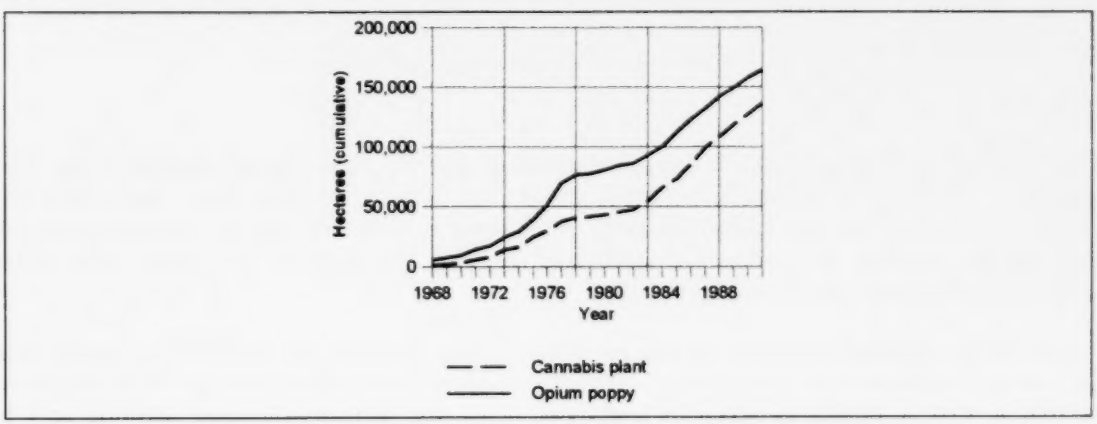
Opium poppy

30. In Colombia, extensive eradication efforts beginning in late 1994 are estimated to have reduced opium poppy cultivation by over 4,000 hectares by the end of 1995. Although the aggregate effect was not known at the time of drafting the present report, such a figure would amount to about a quarter of all opium poppy cultivation.

31. Lebanon has introduced extensive forced eradication of opium poppy in the 1990s, significantly reducing hectarage from a level of between 3,500 and 5,000 hectares of opium poppy cultivation prior to 1990. By 1994, illicit cultivation had been reduced to minimal levels.

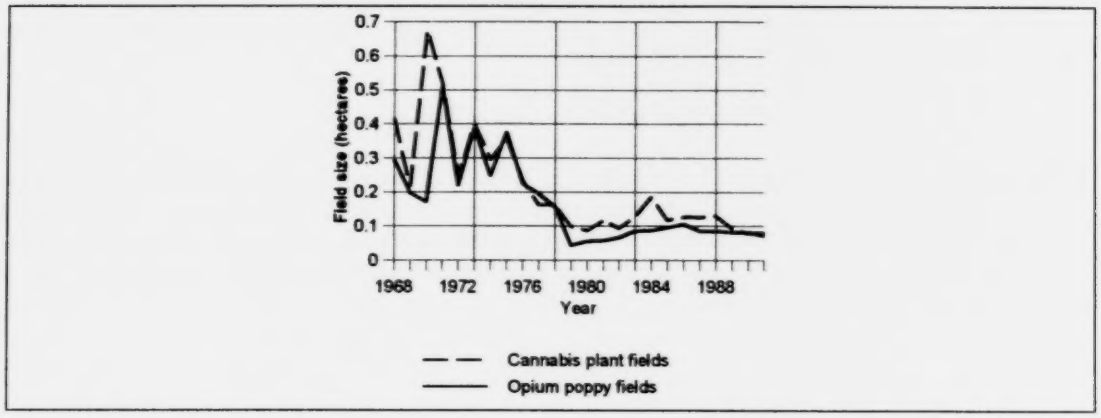
32. Mexico has used both mechanical and chemical techniques in its extensive eradication campaigns against opium poppy and cannabis plant, the latter of which is discussed below. Figure V shows the cumulative amount of eradication in Mexico between 1968 and 1991, giving some indication of the scale of the effort. Prior to the eradication campaigns, fields were large and exposed, but subsequently farmers adapted illicit cultivation, moving to more remote and more dispersed fields. The drop in field sizes coincident with eradication is reflected in figure VI. The overall impact of the eradication effort in Mexico began to decline in the 1980s, and despite continued extensive eradication, Mexico has been a major source of illicit cultivation in the 1990s.

Figure V. Hectares eradicated (cumulative) in Mexico, 1968-1991



Source: Mexico, *Informes Presidenciales* (President's reports), various years, listed in M. C. Toro, *Mexico's "War" on Drugs: Causes and Consequences*, United Nations Research Institute for Social Development and United Nations University Studies on the Impact of the Illegal Drug Trade (London, Lynne Rienner, 1995), vol. 3, pp. 19-20.

Figure VI. Decline in average field sizes in Mexico, 1968-1991



Source: Mexico, *Informes Presidenciales* (President's reports), various years, listed in M. C. Toro, *Mexico's "War" on Drugs: Causes and Consequences*, United Nations Research Institut for Social Development and United Nations University Studies on the Impact of the Illegal Drug Trade (London, Lynne Rienner, 1995), vol. 3, pp. 19-20.

33. There are signs that farmers in Mexico now respond to extensive eradication through equally extensive new planting of opium poppy. Two thirds of the almost 12,000 hectares of opium poppy were eradicated in 1993, but by 1994, gross hectarage had expanded to more than 12,000 hectares. The aggregate effect upon hectarage of the opposing tactics of eradication and new planting are uncertain. While eradication increases risks and costs, the proximity of the United States market is likely to continue to maintain profit margins and encourage new illicit cultivation.

34. Thailand undertakes annual eradication of opium poppy in highland areas by manual techniques. In recent years that has helped to maintain illicit cultivation at relatively low levels, and it is discussed later in more detail in relation to alternative development.

35. Turkey was a major licit opium producer by the early 1970s, but extensive illicit production and diversion of licitly produced opium led to the imposition of an opium ban, with strict control of licit cultivation through a shift to poppy straw production. Part of the success of the control measures may also have been the threat to eradicate the poppy of a whole community if one of its members was found to be illicitly producing opium.

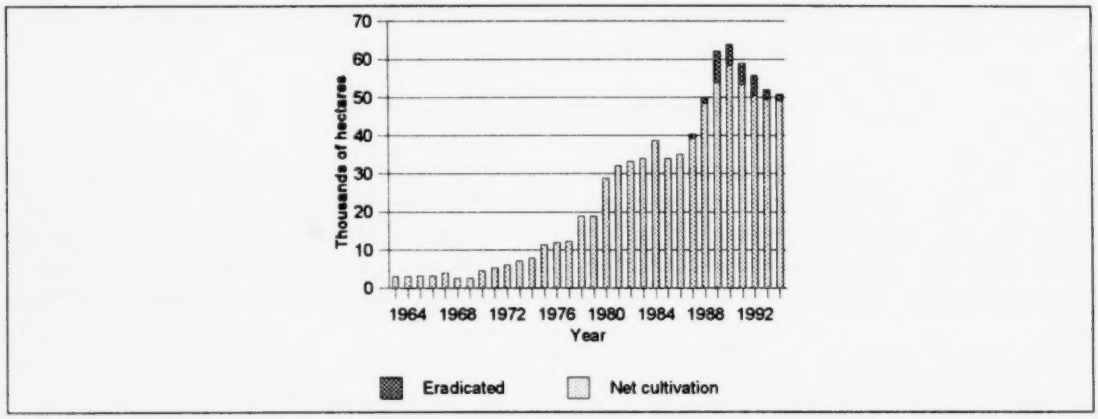
Coca bush

36. In Bolivia, after the banning of chemical eradication, mechanical or manual eradication has proven vulnerable to intimidation, violence and disruption from coca farmers. In 1994, forced eradication efforts were halted when they met with violent resistance, and protests have included sit-ins, roadblocks and public demonstrations, although eradication was reactivated in 1995. Estimates of coca bush cultivation and eradication in Bolivia are shown in Figure VII.

37. Bolivia has attempted voluntary eradication in recent years. Farmers are paid for each hectare of coca bush voluntarily submitted for eradication. In Bolivia, coca cultivation undertaken prior to the enactment of Law 1008 in 1988 is eligible for voluntary eradication. However, there was no prior census of coca bush cultivation, and coca bush after two or three years of growth is difficult to distinguish from older crops, which has made the eligibility criteria of the law difficult to apply. An unanticipated effect has been that some farmers voluntarily submit for eradication those crops that are older and of low yield, because it is more

profitable to take the money and reinvest it in new coca bush which soon brings a higher yield. When payment has been received, the absence of a census means that new planting of crops can be undertaken with relative impunity. Payment for voluntary eradication inadvertently provides a minimum wage per hectare that farmers can earn if the profitability of coca leaf falls, and some increases in voluntary eradication have indeed been noted when leaf prices fall, although there has been little impact upon overall cultivation.

Figure VII. Coca bush cultivation and eradication in Bolivia, 1963-1994



Sources: SUBSEDAL, cited in J. Painter, *Bolivia and Coca: a Study in Dependency*, United Nations Research Institute for Social Development and United Nations University Studies on the Impact of the Illegal Drug Trade (London, Lynne Rienner, 1995), vol. 1, p. 44, and UNDCP.

Note: Where an estimated range was given, a midpoint was used. No pre-1987 eradication data were available.

38. In Colombia, vigorous eradication efforts beginning in late 1994 were reported to have destroyed approximately 25,500 hectares of coca bush by the end of 1995, although the aggregate effect was unknown at the time of drafting the present report. Such a figure would amount to about a half, or more, of total coca bush cultivation.

39. In Peru, where chemical eradication is also banned, forced eradication during the 1980s destroyed less than 4,000 hectares per year, equivalent to approximately 5 per cent of illicit cultivation. The Shining Path insurgent group provided protection for farmers, receiving payment in return. In the first half of the 1980s, some eradication workers were killed, and farmers have shifted to more remote and difficult terrain in the Upper Huallaga Valley, where mechanical eradication is difficult. Peru has also used voluntary eradication along the lines described above in relation to Bolivia.

Cannabis plant

40. Lebanon has implemented eradication of cannabis plant in addition to opium poppy. From an estimated 9,000 hectares of cannabis plant cultivation prior to 1990, hectarage was estimated to have fallen to minimal levels in 1994.

41. In Mexico, extensive eradication of cannabis plant has taken place for many years, as reflected in figure V. While the use of paraquat was discontinued because of its poisonous residue, chemical eradication using glyphosate during the 1970s was successful at least in the medium term. As reflected in Figure VI, cannabis fields appeared slightly larger than opium fields and remained so despite eradication efforts. In

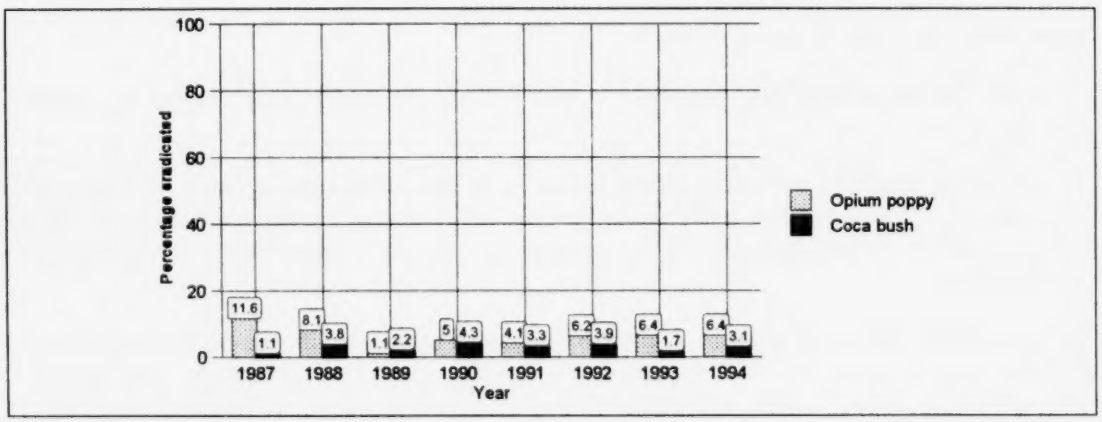
1993, estimated gross cannabis cultivation covered more than 21,000 hectares, nearly half of which was eradicated; but new planting led to the cultivation of almost 19,000 hectares in 1994, more than 8,000 hectares of which were subsequently eradicated, which suggests that farmers may have adapted in response to eradication efforts.

42. The United States undertakes extensive eradication of domestic cannabis plant cultivation. There have been no official estimates of illicit cultivation within the United States in the 1990s, although in 1994, more than 53,000 outdoor plots were reported to have been eradicated, 72 per cent being defined as larger plots that were eradicated by chemical techniques. Of that total, it was estimated that only 1 per cent was intentionally cultivated, the remainder being "ditchweed" cannabis. Trends in the eradication of indoor and outdoor cannabis cultivation in the United States are shown in Figure IV.

5. Global impact of eradication efforts

43. At the global level, the most optimistic assessment is that eradication efforts play at best a role of containment. Figure VIII shows the estimated percentage of global illicit cultivation of opium poppy and coca bush that was eradicated between 1987 and 1994. Estimates for cannabis are constrained by estimates of outdoor and indoor cultivation and of eradication. The global average estimated percentage of eradication of opium poppy and coca bush was always less than 10 per cent between 1990 and 1994, as reflected in figure VIII.

Figure VIII. Estimated percentage of global illicit cultivation eradicated, 1987-1994



Sources: Estimates based on government sources and UNDCP.

44. The estimated percentage of illicit cultivation eradicated in each country in 1993 and 1994 is shown in annex table 3. There was also a large drop in coca bush cultivation in Peru in 1992/93, not shown in table 3, that was primarily due to factors other than eradication, namely crop disease and migration of farmers caused by fighting between government and insurgent groups. Annex table 3 shows a figure of net change in illicit cultivation, from which it can be seen that in some instances where there is fairly extensive eradication, little or no overall reduction occurs because of new planting. In 1994, an increase in hectarage took place at the same time as eradication of coca bush in Bolivia and Colombia and of opium poppy in Afghanistan and Pakistan, which suggests that farmers expanded cultivation either in anticipation of the eradication measures or in reaction to them.

45. The paradox of adaptive responses to forced eradication is that, without continual application, eradication efforts cannot be expected to reduce hectarage, while continual applications may lead to an overestimation of planting requirements by farmers, and possibly to an aggregate increase in illicit cultivation.

B. Crop substitution and its limitations

46. Crop substitution involves giving farmers incentives to switch from illicit to licit crop cultivation. Achieving economic viability and competitiveness poses major difficulties for crop substitution. Some agronomically viable licit crops are not economically viable, while others are economically viable but not competitive with licit crops produced elsewhere or with illicit crops. A 1986 evaluation by the United States Agency for International Development (USAID) of global crop substitution programmes concluded that "the crop substitution strategy has been unsuccessful in introducing substitute crops and in controlling illicit cultivation, at least in the limited span of the typical development initiative. Viable substitute crops are difficult to identify given the generally unfavourable climatic conditions and poorly developed infrastructures that characterize most remote poppy- and coca-growing areas. In many instances, there are not alternative crops that can be grown profitably".[4]

47. Many agronomically viable crops have now been identified, but the necessary years of research limited initial crop substitution efforts. After identification of the crops, the main constraints have been found to be the lack of means of transport of products to markets and the costs and difficulties of marketing. Efforts to overcome those constraints are discussed later. There remain, however, two further major concerns: the inherently attractive qualities, in agronomic, processing and marketing terms, of some of the illicit crops; and, more importantly, the consistently higher prices paid for illicit crops by traffickers.

48. Unlike most crops, coca bush will grow on steeply sloping land, in soil of low fertility. It produces a leaf that is of lower weight per hectare than most crops, which, although it needs to reach the market within three days, can be relatively easily transported if traffickers do not come to the farm to collect it. Although coca bush does not reach full production until the second year, there is partial production in the first. Moreover, since it is perennial and typically produces for 12 to 15 years, its slow process of natural decline is not conducive to substitution of licit alternative crops in the short run. Harvested several times per year, it requires relatively little tending, and provides a steady flow of income. Cannabis plant thrives in a wide variety of conditions, and requires little nurturing, and while opium poppy does require regular attention for weeding, the opium product is of low weight and perishability.

49. The main reason why licit crops lack economic competitiveness is that middlemen and traffickers can often maintain the price of illicit crops above those of licit crops. Tables 1 and 2 show net farm income from opium poppy and coca bush farming, compared to agronomically feasible alternative crops, in, respectively, Pakistan in 1992 and Bolivia in 1990. While prices and incomes vary across time and space, the implications of the tables are likely to remain the same. Studies suggest that the differentials between licit and illicit crop prices were previously much larger than those shown in the tables. Essential oils and saffron, not listed, can compete with opium poppy on a per hectare basis, but the markets will not sustain large increases in supply. Table 2 also shows years until full production, since, while macadamia nuts and rubber are more profitable than coca bush when fully productive, they need 9 and 15 years, respectively, until full production is reached (though rubber plants that mature within about five years have been identified and used in some areas). Investment in such crops requires a loss of current earnings and a risky long-term investment, the profitability of which is dependent upon the vagaries of markets that will not sustain increases in supply without producing a fall in price and profitability.

Table 1. Net farm income (per hectare) from opium poppy and alternative crops in Pakistan, 1992

Crop	*Net income per hectare (United States dollars)*	*As percentage of income from poppy*
Opium poppy	1 689	100.0
Onion	1 272	75.3
Mint	1 178	69.8
Brassica (cabbage)	913	54.1
Corn	279	16.5
Barley	256	15.1
Wheat	222	13.1
Lentils	219	12.9

Source: UNDCP, "The illicit opiate industry of Pakistan", October 1994.

Note: Figures include production costs (seeds, fertilizers, pesticides, hired labour and family labour, irrigation etc.).

Table 2. Net farm income (per hectare) from coca and alternative crops in Bolivia (1990) and years required before commercial and full production

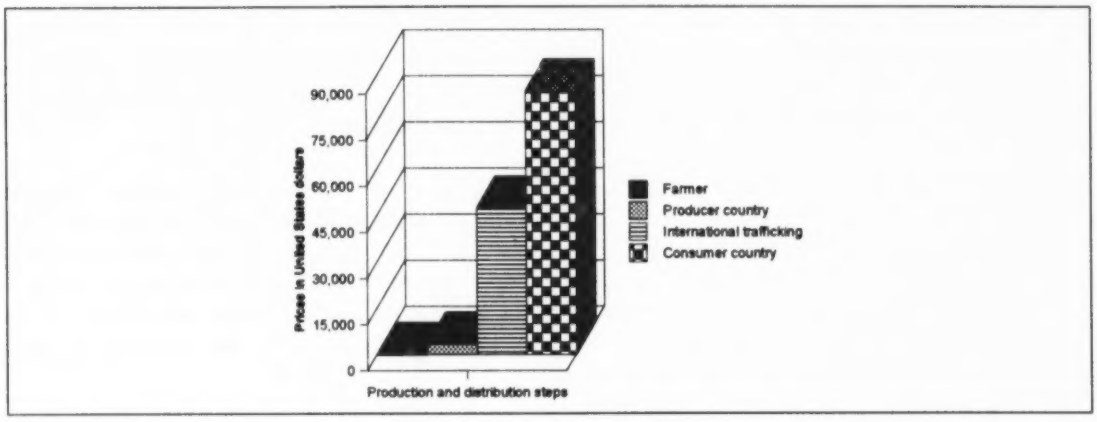
Crop	*Net income per hectare (United States dollars)*	*As percentage of income from coca*	*Years before commercial production*	*Years before full production*
Coca	1 940	100.0	1	2-3
Macadamia nuts	3 640	187.6	7	9-10
Rubber	2 104	108.5	10	15
Pineapple	1 679	86.5	1	2
Black pepper	1 217	62.7	4	5
Oranges	1 156	59.6	4	7
Hearts of palm	1 071	55.2	4	5
Coffee	907	46.8	4	6
Cacao	588	30.3	4	8
Annatto	412	21.2	3	5
Bananas	157	8.1	2	2
Corn	146	7.5	1	1

Sources: UNDCP and USAID, cited in J. Painter, *Bolivia and Coca: A Study in Dependency*, United Nations Research Institute for Social Development and United Nations University Studies on the Impact of the Illegal Drug Trade (London, Lynne Rienner, 1995), vol. 1, table 1.8, p. 20, and table 6.3, p. 138.

Note: Figures include production costs (seeds, fertilizers, pesticides, hired labour and family labour, irrigation etc.).

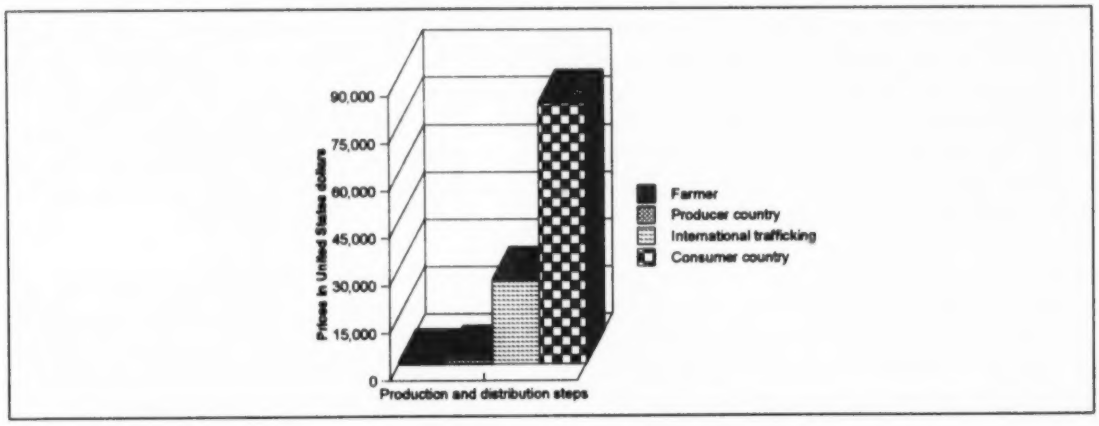
50. The reason why traffickers can maintain the price of illicit crops above that of licit crops in most instances is that the price of the raw material crops is a small fraction of the profits to be made from the manufacture, trafficking and sale of illicit drugs, as reflected in figures IX and X for heroin and cocaine trafficking to Europe and the United States, respectively. Since only a small proportion of the final retail price returns to farmers, where necessary, traffickers can significantly increase the price they pay for crops, in order to maintain or increase the supply in a time of shortage.

Figure IX. Generation of "value added" of heroin in distribution network towards Europe, 1992



Source: E/CN.7/1995/3, p. 12.

Figure X. Generation of "value added" of cocaine in distribution network towards the United States, 1992



Sources: Annual reports questionnaires received by the Executive Director and other UNDCP sources.

C. Economic growth and illicit cultivation

51. Some definitions of drug policy, or even alternative development, have included aspects of general economic growth, or proposed that comprehensive economic growth in producer countries is an alternative strategy to reduce the supply of illicit drugs. It is necessary to distinguish general economic growth from what is described below as alternative development.

52. Sustainable economic growth in developing countries is an aim of national and international economic and social policies, irrespective of the goals of drug policy. However, the notion that the level of economic development of a country is the principal or root cause of illicit cultivation and of the extraction and production of drugs is often overstated: there are many developing countries where illicit cultivation does not occur; there are developed countries where extensive illicit cultivation occurs; and the illicit production of many synthetic drugs has increased in many developed as opposed to developing countries. In addition, while economic growth may indirectly benefit health, education and other areas of social policy, including drug policy, it can also facilitate different aspects of illicit drug trafficking.

53. There appear to be two mechanisms whereby economic growth can promote drug control. The first would be activated if State control over previously isolated areas of cultivation is increased by improved road and communications infrastructure, which facilitates law enforcement and eradication. The second would be activated if economic growth creates competitive economic opportunities that restrain others from taking up illicit cultivation, or induce migration of labour and farmers away from areas of illicit cultivation. If the relinquished hectarage and the possible gap in the illicit market are not offset by the activities of other farmers, then a reduction in illicit hectarage is the result.

54. From a drug control perspective, the diversionary aspect of general economic growth is subject to the constraints of economic competitiveness described for crop substitution, constraints which are determined by the higher and more flexible prices of illicit crops and the subsequent higher income that can be earned. Moreover, in negotiating arrangements for reducing illicit cultivation, general economic assistance carries less weight than targeted alternative development assistance. While there is evidence that economic depression in the licit sector may cause workers to migrate to illicit cultivation, as in Bolivia during the 1980s, there is less evidence that economic boom in the licit sector causes a reversal when illicit cultivation has already been adopted. In the Andean region, the workers who are tempted to migrate back to licit economic activity would be more likely to be the migrant subsidiary workers of the coca trade - leaf pickers and stompers - instead of farmers who had become accustomed to more regular and higher income, and had made some investment in the area. Consequently, economic growth would be expected to have only a marginal indirect impact upon the area of illicit cultivation. Once farmers are established in coca bush cultivation, the long-term effect of substantial migration to urban areas might be primarily to increase the marginal cost of seasonal migrant labour in the production process.

55. The human development index (HDI) gives a crude cross-national comparative indicator of development.[5] Of the major countries of illicit cultivation, Colombia, Mexico, Thailand and the United States are rated at a high level of human development; member States of the CIS in central Asia are rated at either a high or a medium level of human development; Bolivia, China, Jamaica, Lebanon, Morocco, Peru, South Africa and Viet Nam are rated at a medium level of human development; and Afghanistan, India, Lao People's Democratic Republic, Myanmar and Pakistan are rated at a low level of human development. Since HDI is a composite indicator which cannot reflect variation in the levels of development within a country, the area approach to alternative development is discussed in the next section. However, at the national level, there is no significant correlation between the HDI index, HDI rankings or gross domestic product, on the one hand, and the total or crop-specific area of illicit cultivation, on the other, even when only countries with significant areas of illicit cultivation are considered.

D. Alternative development

1. Technique

56. The technique of alternative development has been termed integrated rural development, area development and highland development, in its various forms.* The methodology outlined here has obviously varied greatly in its application.

57. Alternative development operates through the conditional exchange of development assistance for reductions in illicit cultivation (incentives) and the application of law enforcement, where appropriate (disincentives). Development assistance takes three main forms: infrastructure development; provision of alternative agricultural sources of income; and provision of alternative non-agricultural sources of income. The latter two are intended to provide a reasonable alternative income, since experience has demonstrated that economic competitiveness with illicit crops cannot be the sole aim of alternative development. The alternative development approach incorporates a flexibility designed to suit local needs and circumstances, includes feasibility studies and research, and is a lengthy and gradual process.

58. In the negotiation process, a community is able to prioritize certain amenities, which gives initial development work a "spearhead" or quick reward function that gains local confidence. As part of the contract with the development agency, the community undertakes to reduce or eradicate illicit cultivation, as a phased process in line with progress in infrastructural development and the provision of alternative sources of income.

59. Infrastructural development can cover a range of possibilities, including the provision of drinking-water, electricity, hospitals and schools, all of which carry weight in the negotiation process. Economic infrastructural development includes road building to provide market access, irrigation, provision of livestock and fish and training in their farming methods, and building crop storage, processing and agro-industrial facilities. Technical assistance to licit economic activities includes cooperation in agricultural research and training, provision of fertilizer and seed for licit crops, and assistance in the development of transport and in marketing research and operations. The provision of credit facilities for farmers is intended to reduce economic dependence on illicit cultivation during the period of transition to licit economic activity.

60. As development work is completed, local communities are obliged to keep their side of the bargain and phase out illicit cultivation in line with the agreed timetable. A further inducement to ensure that the timetable is adhered to can be a justifiable use of law enforcement, perhaps implemented in consultation with community leaders. Such a step could be less punitive during the period of transition, and should be well publicized to achieve the maximum deterrent effect.

61. The ideal indicator of performance of an alternative development project is the net social benefit, per unit of expenditure, of a reduction in consumption and related costs due to a decrease in illicit supply. More realistically, projects can measure the cost per hectare of reductions, and attempt to measure displacement of illicit cultivation to other areas if it occurs. Ideally, a range of intermediary indicators are used, including the net production value of economic activity in an area, which can indicate the existence of a reasonable alternative income.

2. Risks

62. Alternative development is not without substantial risks. Improving irrigation can end up being counterproductive if it is used to improve illicit cultivation. Roads may make it easier to transport illicit as

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*For a more comprehensive history, see "Alternative development as an instrument of drug control", UNDCP Technical Information Paper No. 5, November 1993.

well as licit crops, and there are recorded instances of roads being used as landing strips by traffickers. In 1986, road construction by USAID in the Chapare region of Bolivia was stopped for those reasons, although it was resumed in 1988.[6] Roads do not necessarily make crops marketable, and transport costs can still be restrictively high. It has been estimated that transport costs from the Upper Huallaga Valley of Peru can amount to 60 per cent of the money to be made from the sale of the crops, and as much as 80 to 85 per cent for crops being transported to Cochabamba from the Chapare region.[7] There are reports that normal market rates for the transport of crops to La Paz from the Chapare region are almost equal to the money that would be made from the sale of the crops. When crops are transported to national centres, gaining entry into international markets, which are usually difficult to penetrate and highly competitive, is not certain. Recent market feasibility studies for Andean products are discussed later in the report.

63. One of the principal limitations of alternative development has been termed reverse conditionality. To communities that do not undertake illicit cultivation, the possibility of gaining development assistance can make illicit cultivation appear attractive. Hence, there is a threat of an expansion of illicit cultivation. The policy response to such a threat in the 1980s was alternative development at the area level, so as to include potential as well as actual areas of illicit cultivation. Costs were thus increased in proportion to coverage, and, paradoxically, there was also a decline in the bargaining power of development assistance in areas of illicit cultivation. In such circumstances, the distinction between drug policy and development policy can become blurred both conceptually and in practice.

64. The project approach to alternative development is designed to reduce illicit cultivation within designated areas. Such an approach, however, makes alternative development likely to promote the displacement of illicit cultivation to other areas, almost certainly more so than in the case of eradication, because of the lengthy and gradual nature of development work. Traffickers have ample time to seek and nurture other sources of illicit crops.

65. While economic competitiveness with illicit crops is not an aim of alternative development, the fact that illicit crops can be a larger source of income than licit economic activities remains a major problem. In most circumstances, licit crops are economically less attractive than illicit crops. There are sometimes overt efforts to maintain the existing state of affairs, including protests against development and sabotage of infrastructure and licit crops. Traffickers have been known to give credit to farmers to ensure that they continue illicit cultivation, an incentive which, on occasion, has been enhanced by the threat, or actual use, of violence. The small fraction of profits that returns to farmers (see figures IX and X), combined with the pulling power of established consumer markets, serves to maintain the economic attraction of illicit cultivation.

3. Implementation

66. Alternative development work requires exceptionally skilled multidisciplinary staffing, which is a scarce resource. Even where the resources are present, the scale and logistics of the work can lead to coordination problems within projects. The testing of and experimentation with alternative crops may require several years within each area. While it is critical to have the backing of the local community and of the Government at all levels, support may be difficult to mobilize. The financing of projects within the necessary multi-stage bureaucracy may proceed slowly, and equipment may be difficult to procure.

67. As noted by the Subcommittee on Rural Development of the Administrative Committee on Coordination (ACC) in its report (issued without a symbol) on its twenty-third session, held at Paris from 31 May to 2 June 1995, even in areas without illicit cultivation, the criteria for the implementation, monitoring and evaluation of rural development are not clear-cut, and are sometimes revised in response to changing needs. The sixth Meeting of the Working Group on Industrial Contribution to Rural Development, reviewing replies from 12 rural development agencies to a fact-finding questionnaire, noted in its report, contained in the report of the ACC Subcommittee on Rural Development on its twenty-third session, that the apparent failure and subsequent abandonment of integrated rural development approaches in the past had been

a result of technical, administrative and programming errors rather than flaws. In addition, the Working Group noted that one of the enduring problems of rural development was its sometimes damaging environmental impact and the lack of genuine commitment of some Governments to the overall goal of rural development. The implementation of alternative development requires all of the elements necessary for rural development, and is conducted in circumstances which are often considerably more difficult than in the case of general rural development, with the additional consideration that the work is an indirect means of achieving a reduction in illicit cultivation.

4. Recent efforts to reduce hectarage

68. Alternative development has been or is currently the subject of programmes or projects in most of the major areas of illicit cultivation of opium poppy or coca bush cultivation. International efforts against opium poppy began in Asia in the early 1970s, and against coca bush in Latin America in the 1980s. While information regarding national and bilateral efforts, where available, is presented below, the emphasis is upon UNDCP-related projects and programmes for which information up to mid-1995 is provided.

Opium poppy

69. In Afghanistan, the one UNDCP alternative development project was not successful in achieving its drug control objectives, despite project expenditure of approximately 8.5 million United States dollars (US$) by mid-1995. Disruption caused by factional fighting in project areas impeded operations, and led to the postponement or transfer of programmes, while logistical difficulties due to the remoteness of project areas required days of travel by foot or pack animal. The project area having been reached, the identification of suitable resources in rural communities slowed down activities. By April 1995, levels of opium poppy cultivation had increased. The estimated large reduction in opium poppy cultivation between 1994 and 1995 was independent of alternative development efforts.

70. In the Lao People's Democratic Republic, United Nations highland alternative development projects began in 1989 in an area with an estimated 390 hectares of opium poppy cultivation and 3.5 tonnes of opium production, slightly more than 1 per cent of the estimated total for the country as a whole. A road connection was constructed, and the production, storage and processing of rice, coffee, fruit and vegetables developed, along with livestock and fisheries. There was an approximately 60 per cent reduction in estimated hectarage across the whole of the country during the period concerned, a large part of which was attributable to poor weather rather than eradication or other policy measures (opium poppy cultivation is not prohibited). Within the project area, by 1994, after expenditure of $6 million, estimated hectarage had fallen by 80 per cent and estimated production by more than 90 per cent to 300 kilograms. The conservative conclusion is that, taking into account the general reductions, up to 20 per cent of the reduction in the project area might be attributed to the alternative development work, so that by 1994, the estimated cost per hectare of reductions was approximately $92,307 per hectare.

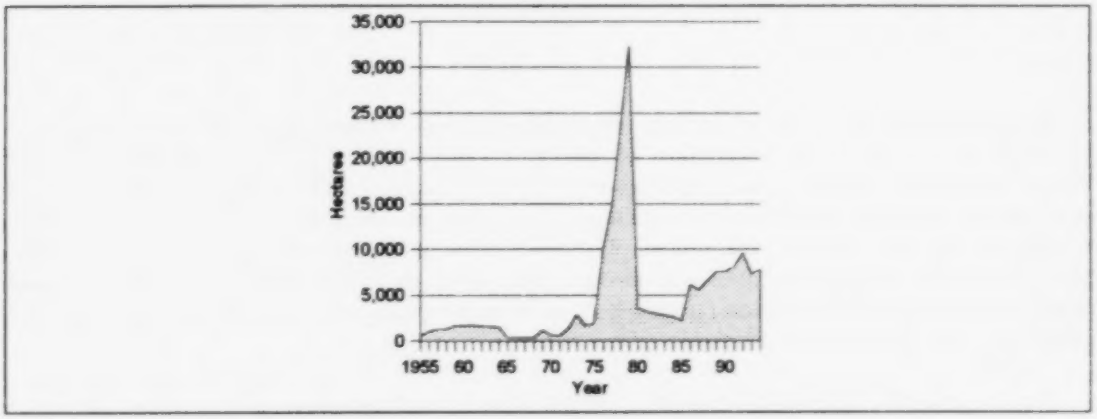
71. The UNDCP programme of projects in the Xieng Khouany Highland area of the Lao People's Democratic Republic began in 1991. The 1995 evaluation concluded that the projects had not achieved any drug control objectives, after project expenditure of $6 million. The work encountered delays and problems in the disbursement of loan funds.

72. In Mexico, the United Nations programme of alternative development ran from 1989 to 1992. It was designed to promote licit economic activities and worker cooperatives through seminars, training and technical assistance as well as infrastructure development. At the conclusion of the project, illicit cultivation had increased, despite the expenditure of $15 million in the areas of Oaxaca, Guerrero and Michoacan.

73. In Pakistan, the Buner project in the Swat district of the North-West Frontier Province has been cited as a model for the implementation of development work in areas of illicit cultivation.[8] Prior to 1976, Buner

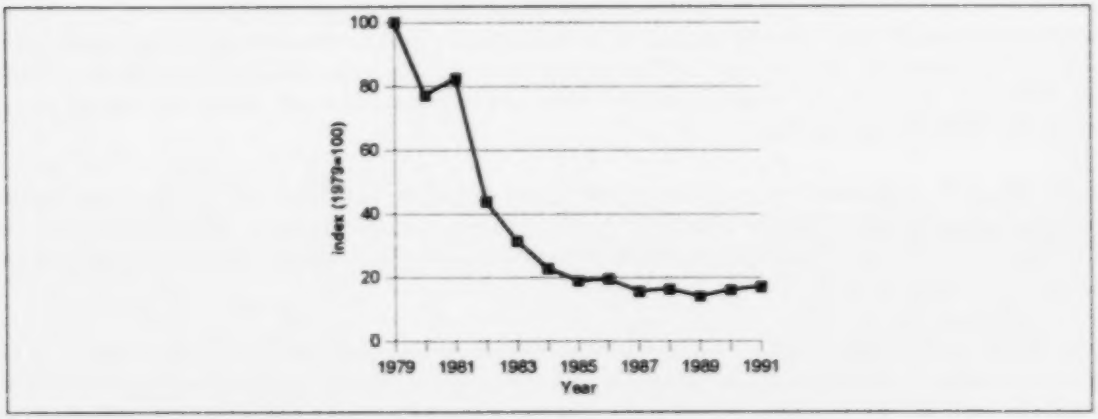
accounted for approximately a third of the opium produced in Pakistan. In the project area, opium poppy cultivation of 2,878 hectares in 1975/76 rose to 4,025 hectares in 1978/79, but had fallen to zero by 1983.[9] Estimated opium poppy cultivation in Pakistan from 1955 to 1994 is shown as figure XI. The enforcement of a nationwide opium ban, combined with a sharp fall in opium prices due to increased competition from Afghanistan, reflected in figure XII, greatly reduced poppy cultivation across Pakistan. By 1981/82, it had dropped to 20 per cent of its previous levels in the Buner subdistrict, and to 10 per cent of its previous levels in the remainder of Pakistan. Figure XIII shows the trend of reductions in the Buner area and in the remainder of Pakistan after the peak year of 1979. While it is difficult to establish a clear causal connection between the policies and the results achieved, it is arguable that alternative development work in Buner accounted for up to 20 per cent of the reductions in the area. The project cost $11.36 million in 1995 prices, equivalent to a minimum cost of $12,202 per hectare of reductions.

Figure XI. Opium poppy cultivation in Pakistan, 1955-1994



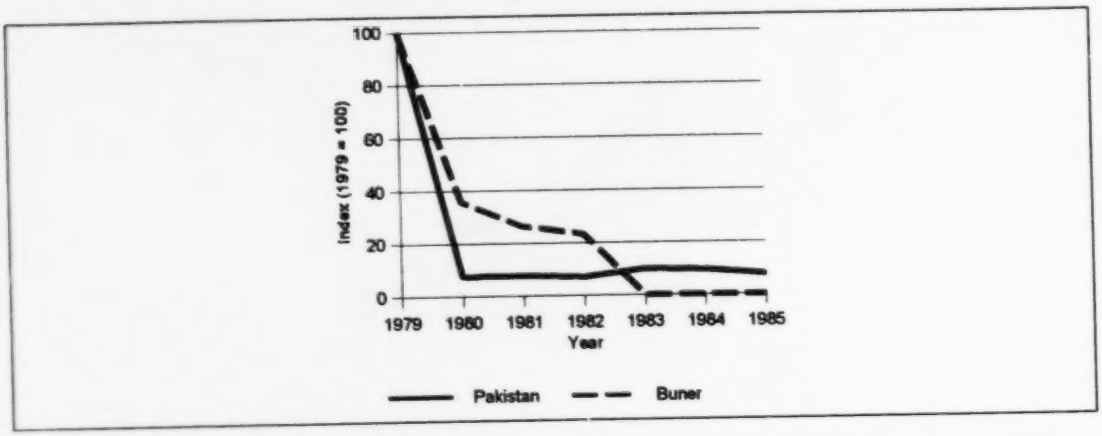
Source: Government of Pakistan, UNDCP and the International Narcotics Control Board, cited in UNDCP, "The illicit opiate industry of Pakistan", October 1994.

Figure XII. Trends in opium farm-gate prices in Pakistan, 1979-1991 (inflation-adjusted)



Source: Pakistan Narcotics Control Board, cited in S. R. Ali Khan, "Poppy cultivation in North-West Frontier Province 1991", report prepared for the Rural Development Division, USAID, Islamabad, December 1991, p. 31.

Figure XIII. Drop in illicit opium cultivation in the Buner subdistrict and other areas of Pakistan, 1979-1985



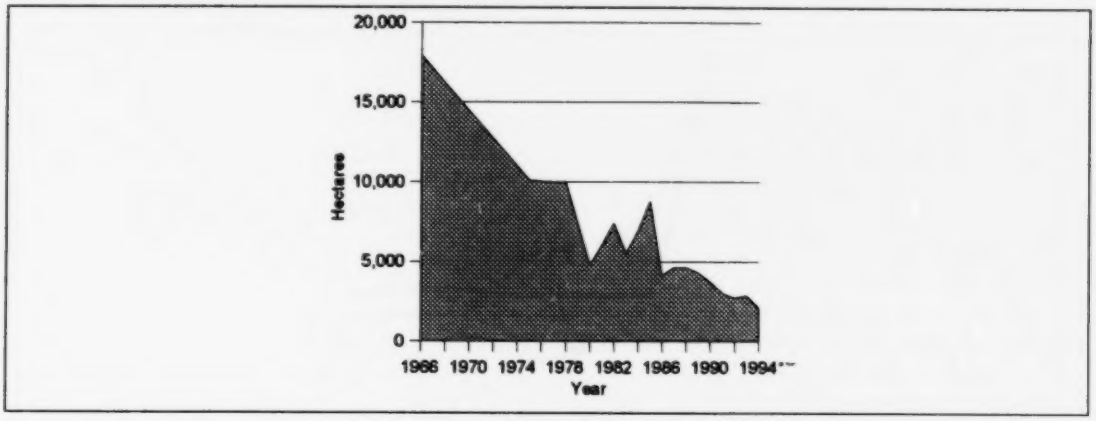
Source: Government of Pakistan, UNDCP and International Narcotics Control Board.

74. United Nations alternative development efforts in the Dir district of Pakistan began in 1985. The 1993 evaluation concluded that, as a result of the United Nations project and the phased enforcement measures, the areas concerned were virtually free of opium poppy cultivation, though displacement to neighbouring areas had been extensive. Opium poppy cultivation in neighbouring areas rose from 296 hectares in 1984 to more than 4,900 hectares in 1993, an increase five times greater than the threefold national average, suggesting extensive displacement. Project expenditure by the end of 1994 was approximately $23.5 million.

75. Thailand has experienced significant reductions in opium poppy cultivation, which are maintained through annual eradication efforts. From an estimated level of 18,000 hectares in 1965, opium poppy cultivation had fallen to 2,110 hectares by 1994, a reduction of 88 per cent, as shown in figure XIV. Such a change is believed to have been due to a range of factors, in particular the following: a firm commitment by the Government of Thailand to increasing State control over highland areas; positive long-term trends in the growth of the Thai economy, which has performed better than neighbouring economies; reduced profitability of opium due to competition from rapidly expanding cultivation in Myanmar, which more than filled the gap in the market left by the reductions in Thailand. Such a convergence of elements seems to have made the highland areas ripe for the implementation of development work, although the bulk of United Nations alternative development assistance was not provided until the 1980s, by which time a large part of the reductions had already occurred. One independent 1993 estimate of the total cost of combined alternative development efforts was $125 million,[10] which, taking the 1965 hectarage as the base, would give an estimated cost of $7,812 per hectare of reductions.

76. In Myanmar, a three-year UNDCP project costing $2.3 million, begun in 1992, was scaled down in 1994 because of fighting between insurgent and government forces. Road-building was deferred, and while some agricultural work was started, villages in the project area were ransacked during the fighting, there were problems of staffing the project, and communication networks were poor and unreliable. Subsequently, a one-year pilot project involving preparatory assistance for alternative development was begun in the area under the control of the Wa people, with a budget of $348,085. Its primary aim was to design possible future initiatives, but there were reported difficulties in gaining the confidence of the local population in areas of civil instability.

Figure XIV. Opium poppy cultivation in Thailand, 1966-1994



Source: UNDCP, "Evaluation of assistance in alternative development in Thailand", May 1993, table A.1.

Note: Data for missing years (1974, 1976, 1977 and 1979) estimated from contiguous values.

Coca bush

77. A 1993 independent review of USAID and UNDCP efforts in Latin America concluded that "more than a decade of crop substitution programmes in cocaine-source countries has had little impact on the dynamics of Andean coca cultivation. There has been little actual crop substitution".[11] The review noted that while some projects have recorded increases in licit economic activity and reductions in coca cultivation within designated project areas, these do not guarantee a hold on the overall scale of illicit cultivation. The 1993 UNDCP programme evaluation of efforts in Latin America concluded that under specific planning and implementation conditions, alternative development could reduce illicit cultivation within project areas, but that general rural development without a drug control component should not be funded by UNDCP.

78. In Bolivia, alternative development projects were initially undertaken by USAID, and the Chapare Regional Development Project was begun in 1983, ending in 1992 after expenditure of $64.2 million. The Associated High Valleys project, located outside the main producing areas, was designed to reduce in-migration and increase out-migration from coca-bush cultivating areas of the Chapare. A 1990 USAID evaluation noted that even if the Associated High Valleys project were to prevent labour movements from the area, the large and mobile labour force in other parts of Bolivia would more than compensate the coca-bush cultivating areas for the loss. More recent USAID work provides marketing and export assistance and technical advice on agricultural services, credit services and infrastructural development.[12] Historically, both development work and economic policy in Bolivia have had a mixed relationship with drug policy, and have even inadvertently contributed to increased coca bush cultivation at different times. Migration to the Chapare during the 1960s and 1970s was facilitated by an internationally funded "colonization" programme and a paved road constructed to the area. Electrification of some areas was delayed because of fears that it would assist drug processing, although such action has been reversed in the 1990s. During the Bolivian drought of 1983/84, a credit programme designed to relieve hardship encouraged migration to Chapare and the pursuit of illicit cultivation as the easiest means of ensuring repayment.[13]

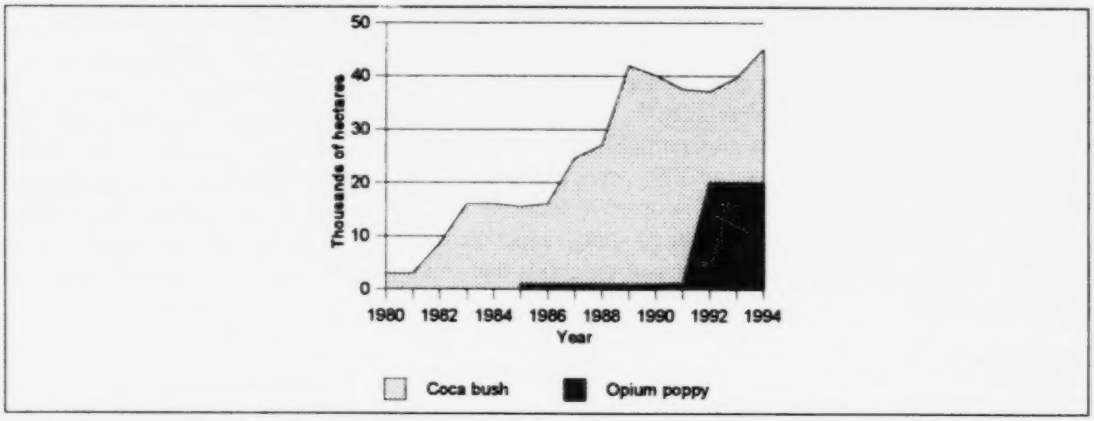
79. UNDCP efforts in the region of Las Yungas began in 1985, and were reduced in 1990 after expenditure of $21.8 million, since, under Bolivian Law 1008 of 1988, the majority of the coca bush cultivation in the area had transitional status. That legislative change, while not reducing the area of land under coca bush, brought the most extensive recorded reductions to date in illicit cultivation. Alternative development efforts

were refocused towards assisting the transitional move from coca. By 1995, of the eight "Mayachasita" community centres constructed in LasYungas since 1988, one was working satisfactorily, three were functioning regularly, and four were abandoned because of problems of profitability. Expenditure in Las Yungas totalled about $30 million by 1995. The Chapare has recently been the focus of an extensive UNDCP programme of alternative development, and it is estimated that 24,000 hectares of coca bush have been eradicated since 1987 within project areas, although the overall impact has been reduced by new planting elsewhere.

80. While there have been reductions within some project areas, in the aggregate, Bolivia seems to have experienced the parallel growth of coca bush and licit agricultural activities. The cultivation of alternative crops has increased greatly, but not necessarily at the overall expense of coca bush cultivation. Rather, there has been an overall increase in agricultural output. That is perhaps as would be expected, since many early alternative development projects had little conditionality attached to the development assistance, an aspect to which particular attention has been devoted in the programmatic activities of UNDCP.

81. In Colombia, while the aggregate level of coca bush and opium poppy cultivation increased in the decade up to 1994, there were some reductions in coca bush cultivation within UNDCP project areas. As detailed above, Government eradication efforts during 1995 may have had a significant impact upon overall illicit cultivation, although the aggregate impact was not known at the time of writing the present report. Figure XV shows the estimated hectarage of coca bush and opium poppy cultivation in Colombia, where there have been no international alternative development operations in areas of opium poppy cultivation.

Figure XV. Illicit cultivation of coca bush and opium poppy in Colombia, 1980-1994



82. The UNDCP programme in Colombia includes ongoing projects in four areas. Efforts began in 1985 in the Southern Cauca and Northern Narino areas, where estimated coca bush cultivation was reduced from 5,400 hectares in 1986/87 to about 1,700 hectares by 1994. The project budget was $4.4 million, representing an estimated cost of only $1,189 per hectare of reductions, although new planting of coca bush in nearby areas was reportedly extensive. Other projects have been in operation only since 1991. In Caqueta, with a budget of $3.85 million, the estimated 2,000 hectares of coca bush cultivation in 1991 had been reduced to around 1,500 hectares by mid-1995, while illicit cultivation expanded outside the project area. In the third project area, Guaviere, an estimated 8,900 hectares of cultivation at the beginning of work in 1991 had been reduced by 200 hectares, and a further 350 hectares were in the process of being removed, by mid-1995. Rubber trees that take only 4 to 5 years to reach maturity have been planted in the midst of coca bush with which they compete for light within six months. In the Putumayo, of the estimated

3,200 hectares of cultivation at the start of alternative development work in 1991, about 500 hectares had been removed by mid-1995.

83. In Peru, the results of work in the Upper Huallaga Valley since 1981 were described in a 1986 evaluation by USAID as disappointing, because of the greater profit to be made from coca, the repercussions of the protests, sometimes of a violent nature, which had taken place and the relocation of cultivation within the Valley. Overall, hectarage of coca bush cultivation declined in Peru in the early 1990s as a result of crop disease and the relocation of farmers away from fighting between insurgent and government forces.

84. UNDCP efforts in the Upper Huallaga Valley of Peru may have contributed to the estimated reduction within the project area from 24,500 hectares of cultivation in 1987 to 8,479 hectares in 1995, a reduction due mainly to a combination of crop disease and migration away from fighting between government and insurgent forces. Work in the Valley of the Convencion and Lares since 1985 has resulted in an expansion of licit economic activities, the development of agricultural research and training and the increasing utilization of credit facilities. In 1995, after an expenditure of approximately $17 million, coca cultivation within the project area was estimated at 34,000 hectares, of which 21,000 were in production.

85. In both Bolivia and Peru there have been overt attempts by coca growers and insurgent groups to disrupt alternative development work. The Shining Path movement in Peru has destroyed roads and bridges to disrupt transportation from the Upper Huallaga Valley. In Bolivia, coca growers have been responsible for destruction of licit crops, though cooperation has improved in recent years. Drug traffickers, besides manipulating prices to encourage illicit cultivation, have also used threats and violence as a means of coercion, and traffickers are reported to have given credit to farmers to ensure continuation of coca bush cultivation.

86. Trade agreements promoting the export trade from the Andean region are intended to support alternative development work as it takes root. UNDCP has recently sponsored studies of marketing and export opportunities for selected alternative crops in the Andean region and a study of access to the markets of the United States and the European Community.[14] The Generalized System of Preferences, which has been implemented since 1976, grants some preferential treatment to Andean products in the United States market, while the Andean Trade Preference Act of 1991 gives preference in the United States market to the products of Bolivia, Colombia, Ecuador and Peru, in order to increase the licit economic opportunities available to those countries. Andean countries are granted some reductions in customs duties on their exports to the European Community, and duties are eliminated on goods that cannot be supplied by producers within the European Community.

Cannabis plant

87. In the Bekaa Valley of Lebanon, previous efforts at crop substitution by the Food and Agriculture Organization of the United Nations were abandoned because of an escalation of armed conflict in the area. In 1993, UNDCP initiated an alternative development project in the Baalbeck-Hermel areas of the Bekaa Valley, which, prior to the eradication carried out in the 1990s, had been an area of significant illicit cannabis plant and opium poppy cultivation. The alternative development work is not aimed at reducing illicit cultivation, but is intended to create licit economic activities that will reduce the incentive to return to illicit cultivation, a pre-emptive investment against recidivism.

88. In Morocco, a three-year pilot project began in 1988, focusing upon a village in the Rif region to determine the extent to which alternative development could be used to reduce economic dependence on cannabis cultivation. While several development objectives were achieved, there were reports that irrigation was used to water cannabis plant, and there were no reductions in illicit cultivation. After expenditure of $2.4 million, the project was not extended.

5. Discussion

89. The balance of evidence suggests that, in the conditions outlined below, alternative development work can serve to facilitate a transition from illicit to licit cultivation within targeted areas. It can provide, in effect, an economic safety net into which farmers of illicit crops can jump. The three prerequisites for success appear to be the following: effective control of an area by a central Government and an absence or weakening of insurgent groups; the existence of market forces that make illicit cultivation less attractive, primarily in the form of increased competition from expanding illicit cultivation elsewhere, as in the case of Afghanistan and Myanmar, neighbouring, respectively, Pakistan and Thailand; consistently applied disincentives through law enforcement and eradication. Where those three prerequisites converge, a fourth, namely incentives in the form of reasonable alternative sources of income in the area, may make a negotiated reduction in hectarage attractive at a time when illicit cultivation is less profitable and more risky, and likely to become increasingly so. While alternative development work might accelerate a transition to licit activity, or help to prevent recidivism, through creating the incentives which constitute the fourth prerequisite referred to above, it does not necessarily give rise to the other three.

90. There appear to be five key constraints upon alternative development as an appropriate technique for reducing illicit cultivation. In the order of the project cycle those constraints are as follows:

(a) Failure of development implementation due to the logistical complexity of implementation in a multi-agency (and sometimes competitive) funding and executing environment which requires cooperation from all tiers of Government in areas where the conditions are non-conducive, and where there is sometimes overt hostility, to development work. In such circumstances, the chances of implementation failure are far higher than for normal development work, and there are a number of factors that may cause the negotiation process to break down;

(b) Failure to achieve the drug control objective, since where development work is implemented it does not necessarily bring reductions in illicit cultivation;

(c) Reverse conditionality, whereby development work may catalyse illicit cultivation;

(d) Lack of sustainability of the economic viability of substitute crops and activities;

(e) Replacement and displacement of illicit crops, to which alternative development is particularly prone because of its lengthy duration.

All the above-mentioned factors are independent of the expansion of illicit cultivation due to exogenous factors.

III. CONCLUSIONS

91. Despite the range of efforts described, only two instances of absolute reductions in illicit cultivation have been recorded at the national level, in Thailand and Turkey, both cases occurring prior to recent severalfold increases in global cultivation of opium poppy. The reduction in opium poppy cultivation in Turkey coincided with increases in the opium supply from Mexico (for the heroin market in the United States) and from parts of Asia. The reductions in opium cultivation in Thailand were more than accounted for at the global level by increases in neighbouring Myanmar. Hence, even the impact of those cases of absolute reduction at the national level was greatly diluted at the global level. The other major supplier that came close to absolute reductions at the national level due to intense eradication efforts was Mexico in the mid-1970s, which by 1994 had substantial areas of illicit cultivation. Large increases in illicit cultivation in Afghanistan may partly account for reductions in illicit cultivation in Pakistan. At both the national and the global level, the adaptability of the illicit market caused by robust economic incentives is reflected in the

"balloon effect", or the displacement and replacement of illicit crops, and has served to reduce the overall efficacy of measures to reduce illicit cultivation. Nevertheless, successful efforts at the national level to eliminate or reduce illicit cultivation may have helped to curb the rise in total global production.

92. Of the five Asian countries where opium cultivation was tackled by United Nations alternative development efforts, partial reductions were recorded, in some instances, in three. In Thailand, the major reductions occurred before the bulk of United Nations drug control investment in alternative development was made, and decreases in Pakistan were largely due to law enforcement and reduced opium prices, although alternative development may have sustained reduction efforts in some areas. Of two programmatic activities in the Lao People's Democratic Republic, one recorded no reductions in illicit cultivation, and the other recorded some decrease within the context of general reductions for the country as a whole. There is no evidence that the progressive limited reduction of coca bush within project areas in Latin America have had an effect in the aggregate. In Lebanon, illicit cultivation of opium poppy and cannabis plant was reduced in the 1990s through eradication, whereas alternative development efforts in Morocco did not reduce cannabis cultivation. Lack of a clear emphasis on drug control at the project level until the early 1990s, combined with the lack of parallel implementation of drug control legislation, may have contributed to the failure to achieve measurable success in some areas.

93. The last two decades have seen significant progress in developing an understanding of the dynamics of illicit crop cultivation and related drug control strategies. Experience has shown that some programmes may be effective in promoting development, encouraging the growth of licit agricultural and other economic activities, and reducing the level of illicit cultivation in targeted areas. In addition to implementing the provisions of the international drug control treaties, such programmes might benefit from having a national and regional focus which could improve the prospect of their achieving a substantial reduction in the cultivation of illicit crops over the longer term.

Notes

[1]United Nations, *Treaty Series*, vol. 976, No. 14152.

[2]*Official Records of the United Nations Conference for the Adoption of a Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, Vienna, 25 November-20 December 1988*, vol. I (United Nations publication, Sales No. E.94.XI.5).

[3]*K. J. Riley, Snow Job: the Efficacy of Source Country Cocaine Policies* (Santa Monica, California, RAMD Corporation, 1993).

[4]K. Kumar and others, "A review of AID's narcotic control development assistance program", AID Evaluation Special Study No. 29, cited in R. Lee and P. Clawson, *Crop Substitution in the Andes* (Washington, D.C., Office of National Drug Control Policy, 1993), p. 7.

[5]United Nations Development Programme, *Human Development Report 1995* (Oxford, Oxford University Press, 1995).

[6]J. Painter, *Bolivia and Coca: a Study in Dependency*, United Nations Research Institute for Social Development and United Nations University Studies of the Impact of the Illegal Drug Trade (London, Lynne Reinner, 1995), vol. 1, p. 110.

[7]UNDCP and USAID sources cited in R. Lee and P. Clawson, *Crop Substitution in the Andes* ..., p. 56.

[8]Pakistan Narcotics Control Board, *Buner Pilot Project* (Islamabad, March 1974), and *Socio-economic Survey of Buner* (Islamabad, 1975).

[9]See "Drug crop substitution", background paper prepared by the Food and Agriculture Organization of the United Nations for the Inter-agency Meeting on Coordination in Matters of International Drug Abuse Control, Rome, 11-13 September 1985, and "Alternative development as an instrument of drug control", UNDCP Technical Information Paper No. 5, November 1993.

[10]R. Lee, "Thailand narcotics study" (unpublished), March 1994.

[11]R. Lee and P. Clawson, *Crop Substitution in the Andes* ..., p. 1.

[12]J. Painter, *Bolivia and Coca ..., chap. VI.*

[13]J. Painter, *Bolivia and Coca* ..., p. 6.

[14]International Trade Centre UNCTAD/GATT, *Market Access to the United States and the European Community for Selected Products from the Andean Region* (Geneva, 1993).

Annex

ERADICATION ESTIMATES

Table 3. Estimated eradication of illicit cultivation in major producer countries, 1993 and 1994, and net impact after new illicit cultivation

Country or region	*Percentage eradicated in 1993*	*1994*		
		Percentage eradicated	*Percentage Change in net area of cultivation*	*Percentage of global net cultivation*
A. Coca bush				
Bolivia	4.84	2.15	+1.91	23.85
Colombia	1.96	9.84	+13.35	22.31
Peru	0.00	0.00	-0.18	53.84
World	1.61	2.87	+3.07	100.00
B. Opium poppy				
A. South Asia				
Afghanistan	0.00	0.00	+38.43	12.32
India	0.00	0.00	+25.00	2.32
Pakistan	12.00	5.99	+15.76	3.07
Total, A	2.62	1.09	+32.08	17.71
B. East Asia		0.00		
China	..	..	..	0.83
Lao People's Democratic	0.00	0.00	-28.88	7.82
Myanmar	0.36	2.23	-11.58	61.87
Thailand	0.00	0.00	-26.74	0.89
Total, B.	0.31	1.94	-13.11	71.41
C. Latin America			0.00	
Colombiia	32.93	18.95	0.00	8.44
Mexico	66.38	53.32	+46.34	2.45
Total, C	42.11	30.45	+7.66	10.89
World	7.21	5.99	-5.39	100.00

Sources: UNDCP estimates based on government and UNDCP sources.

Notes: Totals may not add precisely because of rounding.

Two dots (..) indicate that data are not available.

Gilobal eradication estimates include all estimates of cultivation even if eradication data are not available.